

Strategy under **uncertainty**

Hugh G. Courtney, Jane Kirkland, and S. Patrick Viguerie

The traditional approach to strategy requires precise predictions and thus often leads executives to underestimate uncertainty. This can be downright dangerous. A four-level framework can help.

At the heart of the traditional approach to strategy lies the assumption that executives, by applying a set of powerful analytic tools, can predict the future of any business accurately enough to choose a clear strategic direction for it. The process often involves underestimating uncertainty in order to lay out a vision of future events sufficiently precise to be captured in a discounted-cash-flow (DCF) analysis. When the future is truly uncertain, this approach is at best marginally helpful and at worst downright dangerous: underestimating uncertainty can lead to strategies that neither defend a company against the threats nor take advantage of the opportunities that higher levels of uncertainty provide. Another danger lies at the other extreme: if managers can't find a strategy that works under traditional analysis, they may abandon the analytical rigor of their planning process altogether and base their decisions on gut instinct.

Hugh Courtney is a consultant in McKinsey's Washington, DC, office; **Jane Kirkland** is an alumnus of the New York office; and **Patrick Viguerie** is a principal in the Atlanta office. This article is adapted from one that appeared in *Harvard Business Review*, November–December 1997.

Making systematically sound strategic decisions under uncertainty requires an approach that avoids this dangerous binary view. Rarely do managers know absolutely nothing of strategic importance, even in the most uncertain environments. What follows is a framework for determining the level of uncertainty surrounding strategic decisions and for tailoring strategy to that uncertainty.

Four levels of uncertainty

Available strategically relevant information tends to fall into two categories. First, it is often possible to identify clear trends, such as market demographics, that can help define potential demand for a company's future products or services. Second, if the right analyses are performed, many factors that are currently unknown to a company's management are in fact knowable—for instance, performance attributes for current technologies, the elasticity of demand for certain stable categories of products, and competitors' plans to expand capacity.

The uncertainty that remains after the best possible analysis has been undertaken is what we call residual uncertainty—for example, the outcome of an ongoing regulatory debate or the performance attributes of a technology still in development. But quite a bit can often be known despite this. In practice, we have found that the residual uncertainty facing most strategic-decision makers falls into one of four broad levels.

Level one: A clear enough future

The residual uncertainty is irrelevant to making strategic decisions at level one, so managers can develop a single forecast that is a sufficiently precise basis for their strategies. To help generate this usefully precise prediction of the future, managers can use the standard strategy tool kit: market research, analyses of competitors' costs and capacity, value chain analysis, Michael Porter's five-forces framework, and so on. A DCF model that incorporates those predictions can then be used to determine the value of alternative strategies.

Level two: Alternative futures

The future can be described as one of a few discrete scenarios at level two. Analysis can't identify which outcome will actually come to pass, though it may help establish probabilities. Most important, some, if not all, elements of the strategy would change if the outcome were predictable.

Many businesses facing major regulatory or legislative change confront level two uncertainty. Consider US long-distance telephone providers in late 1995,

as they began developing strategies for entering local telephone markets. Legislation that would fundamentally deregulate the industry was pending in Congress, and the broad form that new regulations would take was fairly clear to most industry observers. But whether the legislation was going to pass and how quickly it would be implemented if it did were still uncertain. No amount of analysis would allow the long-distance carriers to predict those outcomes, and the correct course of action—for example, the timing of investments in network infrastructure—depended on which one materialized.

In another common level two situation, the value of a strategy depends mainly on competitors' strategies, which cannot yet be observed or predicted. For example, in oligopoly markets, such as those for pulp and paper, chemicals, and basic raw materials, the primary uncertainty is often competitors' plans for expanding capacity. Economies of scale often dictate that any plant built would be quite large and would be likely to have a significant impact on industry prices and profitability. Therefore, any one company's decision to build a plant is often contingent on competitors' decisions. This is a classic level two situation: the possible outcomes are discrete and clear, and it is difficult to predict which will occur. The best strategy depends on which one does.

> In classic level two situations, the possible outcomes are discrete and clear but **hard to predict**

Here, managers must develop a set of discrete scenarios based on their understanding of how the key residual uncertainties might play out. Each scenario may require a different valuation model. Getting information that helps establish the relative probabilities of the alternative outcomes should be a high priority. After establishing an appropriate valuation model for—and determining the probability of—each possible outcome, the risks and returns of alternative strategies can be evaluated with a classic decision analysis framework. Particular attention should be paid to the likely paths the industry might take to reach the alternative futures, so that the company can determine which possible trigger points to monitor closely.

Level three: A range of futures

A range of potential futures can be identified at level three. A limited number of key variables define that range, but the actual outcome may lie anywhere within it. There are no natural discrete scenarios. As in level two, some, and possibly all, elements of the strategy would change if the outcome were predictable.

Companies in emerging industries or entering new geographic markets often face level three uncertainty. Consider a European consumer goods company

deciding whether to introduce its products to the Indian market. The best possible market research might identify only a broad range of potential customer penetration rates—say, from 10 percent to 30 percent—and there would be no obvious scenarios within that range, making it very difficult to determine the level of latent demand. Analogous problems exist for companies in technologically driven fields, such as the semiconductor industry. When deciding whether to invest in a new technology, producers can often estimate only a broad range of potential cost and performance attributes for it, and the overall profitability of the investment depends on those attributes.

The analysis in level three is similar to that in level two: a set of scenarios describing alternative future outcomes must be identified, and analysis should focus on the trigger events indicating that the market is moving toward one or another scenario. Developing a meaningful set of scenarios, however, is less straightforward in level three. Scenarios that describe the extreme points in the range of possible outcomes are often relatively easy to develop but rarely provide much concrete guidance for current strategic decisions. Since there are no other natural discrete scenarios in level three, deciding which possible outcomes should be fully developed into alternative scenarios is a real art. But there are a few general rules. First, develop only a limited number of alternative scenarios—the complexity of juggling more than four or five tends to hinder decision making. Second, avoid developing redundant scenarios that have no unique implications for strategic decision making. Third, develop a set of scenarios that collectively account for the probable range of future outcomes and not necessarily the entire possible range. Establishing the range of scenarios should allow managers to decide how robust their strategies are, to identify likely winners and losers, and to determine, at least roughly, the risk of following status quo strategies.

Level four: True ambiguity

A number of dimensions of uncertainty interact to create an environment that is virtually impossible to predict at level four. In contrast to level three situations, it is impossible to identify a range of potential outcomes, let alone scenarios within a range. It might not even be possible to identify, much less predict, all the relevant variables that will define the future.

Level four situations are quite rare, and they tend to migrate toward one of the others over time. Nevertheless, they do exist. Consider a telecommunications company deciding where and how to compete in the emerging consumer multimedia market. The company will confront a number of uncertainties concerning technology, demand, and relations between hardware and content providers. All of these uncertainties may interact in ways so unpredictable that no plausible range of scenarios can be identified.

Companies considering major investments in postcommunist Russia in 1992 faced level four uncertainty. They could not predict the laws or regulations that would govern property rights and transactions—a central uncertainty compounded by additional uncertainty about the viability of supply chains and about the demand for previously unavailable consumer goods and services. Shocks such as a political assassination or a currency default could have spun the whole system toward completely unforeseen outcomes.

This example illustrates how difficult it can be to make strategic decisions at level four but also underscores the transitory nature of level four situations. Greater political and regulatory stability has turned decisions about whether to enter Russian markets into level three problems for most industries today. Similarly, uncertainty about strategic decisions in the consumer multimedia market will migrate to level three or to level two as the industry begins to take shape over the next several years.



Situation analysis at level four is highly qualitative. Still, it is critical to avoid the urge to throw up your hands and act purely on instinct. Instead, managers need to catalog systematically what they know and what it is possible to know. Even if it is impossible to develop a meaningful set of probable, or even possible, outcomes, managers can gain a valuable strategic perspective. Usually, they can identify at least a subset of the variables determining how the market will evolve over time. They can also identify favorable and unfavorable indicators of these variables—indicators that will let them track the market's evolution over time and adapt their strategy as new information becomes available. By studying how analogous markets developed in other level four situations, by determining the key attributes of the winners and losers, and by identifying the strategies they employed, managers can also identify patterns that show how the market may evolve. Finally, although it will be impossible to quantify the risks and returns of different strategies, managers should be able to identify what information about the future they must believe to justify the investments they are considering. Early market indicators and analogies from similar markets will help sort out whether such beliefs are realistic (*see* sidebar, "Postures and moves," on the next page).

Strategy in level one's clear enough future

In predictable business environments, most companies are adapters. Analysis is designed to predict an industry's future landscape, and strategy involves making positioning choices about where and how to compete. When the underlying analysis is sound, such strategies by definition consist of a series of no-regrets moves.

Adapter strategies in level one situations are not necessarily incremental or boring. For example, Southwest Airlines' no-frills, point-to-point service is a highly innovative, value-creating adapter strategy, as was Gateway 2000's low-cost assembly and direct-mail distribution strategy when it entered the personal-computer market in the late 1980s. In both cases, managers identified opportunities, in low-uncertainty environments, that could be developed within the existing market structure. The best level one adapters

Postures and moves

A company can assume three strategic postures vis-à-vis uncertainty, and three types of actions can be used to implement that strategy.

Strategic postures: shaping, adapting, and reserving the right to play. Fundamentally, a posture defines the intent of a strategy relative to the current and future state of an industry. Shapers aim to drive their industries toward a new structure of their own devising. Their strategies are about creating new opportunities in a market, either by shaking up relatively stable level one industries or by trying to control the direction of the market in industries with higher levels of uncertainty. By contrast, adapters take the current industry structure and its future evolution as givens and react to the opportunities the market offers. The third strategic posture, reserving the right to play, is a special form of adaptation relevant only in levels two through four. It involves making immediate incremental investments putting a company in a privileged position—through superior information, cost structures, or relations between customers and suppliers—that allows the company to wait until the environment becomes less uncertain before formulating a strategy.

A portfolio of actions: big bets, options, and no-regrets moves. A posture is not a complete strategy: it clarifies strategic intent but not the actions required to fulfill that intent. Three types of moves are especially relevant to implementing strategy under conditions of uncertainty. The first is big bets—large commitments, such as major capital investments or acquisitions, that will produce large payoffs in some scenarios and large losses in others. Not surprisingly, shaping strategies usually involve big bets; adapting and reserving the right to play do not. Options are designed to secure the big payoffs of the best-case scenarios while minimizing losses in the worst-case ones; classic examples include conducting pilot trials before the full-scale introduction of a new product, entering into limited joint ventures for distribution to minimize the risk of breaking into new markets, and licensing an alternative technology in case it proves to be superior to a current alternative. Companies reserving the right to play rely heavily on options, though shapers use them as well, either to shape an emerging but uncertain market as an early mover or to hedge big bets. Finally, no-regrets moves are just that—moves that will pay off no matter what happens. Managers often focus on obvious no-regrets moves such as reducing costs, gathering competitive intelligence, or building skills. However, even in highly uncertain environments, strategic decisions such as investing in capacity and entering certain markets can be no-regrets moves.

create value through innovations in their products or services or through improvements in their business systems, without fundamentally changing the industry.

It is also possible to be a shaper in level one situations, but that is risky and rare, since level one shapers, hoping fundamentally to alter long-standing industry structures and conduct, increase the amount of residual uncertainty—for themselves and their competitors—in otherwise predictable markets. Consider the overnight delivery strategy of Federal Express. When the company entered the mail-and-package delivery industry, a stable level one business, FedEx's strategy in effect created level three uncertainty for itself. In other words, even though the chief executive officer, Frederick W. Smith, commissioned detailed consulting reports that confirmed the feasibility of his business concept, only a broad range of potential demand for overnight services could be identified at the time. For the industry incumbents, such as United Parcel Service, FedEx created level two uncertainty. FedEx's move raised two questions for UPS: Will the overnight delivery strategy succeed? And will UPS have to offer a similar service to remain a viable competitor in the market?

Over time, the industry returned to level one stability but with a fundamentally new structure. FedEx's bet paid off, forcing the rest of the industry to adapt to the new demand for overnight services.

Strategy in level two's alternative futures

If shapers in level one try to raise uncertainty, in levels two through four they try to lower it and create order out of chaos. In level two, a shaping strategy is designed to increase the probability that a favored industry scenario will unfold. A shaper in a capital-intensive industry, such as pulp and paper, for example, wants to prevent competitors from creating excess capacity that would destroy the industry's profitability. Consequently, shapers in such cases might commit their companies to preempting competition by building new capacity far in advance of an upturn in demand, or they might consolidate the industry through mergers and acquisitions. But even the best shapers must be prepared to adapt. Consider the Microsoft Network (MSN). It began as a shaping strategy, but in the battle between proprietary and open networks, certain trigger variables—growth in the number of Internet and MSN subscribers, for example, and the activity profiles of early MSN subscribers—provided valuable insight into how the market was evolving. When it became clear that open networks would prevail, Microsoft refocused the MSN concept on the Internet. Microsoft's shift shows that choices of strategic posture are not carved in stone and underscores the value of maintaining strategic flexibility under uncertainty.

The best companies supplement their shaping bets with options that allow them to change course quickly if necessary. Because trigger variables are often fairly simple to monitor in level two, it can be easy to adapt or reserve the right to play.

Strategy in level three's range of futures

Shaping takes a different form in level three. If at level two shapers are trying to promote a discrete outcome, at level three they are simply trying to move the market in a general direction because they can identify only a range of possible outcomes. Consider the battle over standards for electronic-cash transactions. Mondex International, a consortium of financial-services providers and technology companies, is attempting to shape the future by establishing what it hopes will become universal e-cash standards. Its shaping posture is backed by big-bet investments in product development, infrastructure, and pilot experiments to speed customer acceptance. In contrast, regional banks, which don't yet have the deep pockets and skills necessary to set standards for the e-payment market but want to be able to offer their customers the latest electronic services, are mainly choosing adapter strategies. An adapter posture at uncertainty levels three or four is often achieved primarily through investments in organizational capabilities designed to keep options open (exhibit).

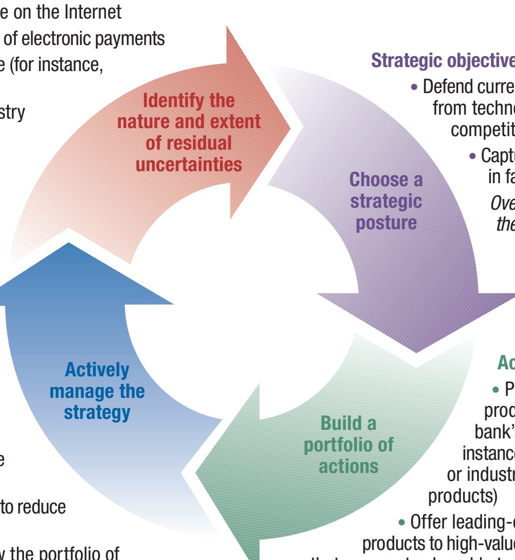
EXHIBIT

A regional bank confronts the uncertainties in electronic commerce

Key areas of uncertainty:

- Volume of electronic commerce on the Internet
- Time line for consumer adoption of electronic payments
- Type of primary payment vehicle (for instance, smart cards, e-cash)
- Emerging structure of the industry
- Degree of vertical integration among players
- Role of banks, others in industry

Determination: Bank faces level 3 and level 4 uncertainties



Strategic objectives:

- Defend current customer franchise from technology-based competitors
- Capture new opportunities in fast-growing markets

Overall posture: Reserve the right to play

Actions:

- Pursue innovative products that play to bank's strengths (for instance, procurement cards or industry-specific payment products)
- Offer leading-edge payment products to high-value customer segments that are most vulnerable to competitors

Possible action: Form a small new-business unit to conduct R&D and monitor industry developments

Strategy management:

- Monitor key trigger events (for instance, adoption rates for emerging products) and the behavior of nontraditional competitors such as telephone companies
- Participate in industry consortia to reduce uncertainty
- Routinely and frequently review the portfolio of actions available

Reserving the right to play is a common posture in level three. Consider a telecommunications company trying to decide whether to make a $1 billion investment in broadband cable networks in the early 1990s. The decision hinged on level three uncertainties, such as the demand for interactive TV service. No amount of solid market research could precisely forecast consumer demand for services that didn't even exist yet. However, incremental investments in broadband network trials could provide useful information and would put the company in a privileged position to expand the business in the future should that prove attractive.

Reserving the **right to play** is a common posture for companies that face level three uncertainty

Strategy in level four's true ambiguity

Paradoxically, though level four situations involve the greatest uncertainty, they may offer higher returns and lower risks for companies seeking to shape the market than situations in levels two or three. Recall that level four situations are transitional by nature, often emerging after major technological, macroeconomic, or legislative shocks. Since no player necessarily knows the best strategy in these environments, the shaper's role is to provide a vision of an industry structure and standards that will coordinate the strategies of other players and drive the market toward a more stable and favorable outcome.

Mahathir Mohamad, Malaysia's prime minister, is trying to shape the future of the multimedia industry in Asia's Pacific Rim. This is truly a level four strategy problem: potential products are undefined, as are such factors as the players, the level of customer demand, and the technology standards. The Malaysian government is trying to create order out of this chaos by investing at least $15 billion to create a Multimedia Super Corridor, a 750-square-kilometer zone, south of Kuala Lumpur, that will include state-of-the-art "smart" buildings for software companies, regional headquarters for multinational corporations, a "multimedia university," a paperless government center called Putrajaya, and a new city called Cyberjaya. By leveraging incentives such as a ten-year exemption from the tax on profits, the corridor has so far received commitments from more than 40 Malaysian and foreign companies, including such powerhouses as Intel, Microsoft, Nippon Telegraph and Telephone, Oracle, and Sun Microsystems. Mahathir's shaping strategy is predicated on the notions that the corridor will create a web of relationships between content and hardware providers and that this web will generate clear industry standards and a set of complementary multimedia products and services.

Shapers need not make bets as enormous as the Malaysian government's to be successful in level three or four situations. All that is required is the credibility to coordinate the strategies of different players in line with the preferred outcome. Netscape Communications, for example, didn't rely on deep pockets to shape Internet browser standards; instead, it leveraged the credibility of its leadership team in the industry so that other players thought, "If these guys think this is the way to go, it must be right for us."

Reserving the right to play is common but potentially dangerous in level four situations. A few general rules apply. First, look for a high degree of leverage. Say, for example, that an oil company is thinking of reserving the right to compete in China by buying an option to establish a beachhead and has a choice of maintaining a small but expensive local operation or developing a limited joint venture with a local distributor. All else being equal, the oil company should go for the low-cost option. Second, don't get locked into one position through neglect. Options should be rigorously reevaluated whenever important uncertainties are clarified and at least every six months. Remember, level four situations are transitional, and most will quickly move toward levels three and two. The difficulty of managing options in level four situations often drives players toward adapter postures. As in level three, such a posture in level four is frequently implemented by making investments in organizational capabilities.

The approach we have outlined offers a discipline for thinking rigorously and systematically about uncertainty. On one plane, this discipline makes it possible for companies to judge which analytic tools can and can't help them make decisions at various levels of uncertainty. On a broader plane, our framework provides a way to tackle the most challenging decisions executives have to make, offering a more complete and sophisticated understanding of the uncertainty they face and its implications for strategy.